

11. A method for engineering a transplantable tissue from a donor tissue comprising:

accessing a recipe including recipe steps;
receiving GUI input from a graphical user interface (GUI); and

accessing, by a controller, the recipe steps, the GUI input, and at least one default value;

forming, by the controller, at least one controller command based on arbitrating the at least one default value, the recipe steps, and the GUI input;

executing, by the controller, the at least one controller command to engineer the transplantable tissue including the donor tissue.

12. The method as in claim **11** further comprising:

updating, by the controller, the GUI based at least on a status of the transplantable tissue; and

updating, by the controller, the recipe based at least on the status.

13. The method as in claim **11** comprising:

configuring at least one valve in a fluid path according to the recipe;

continually adjusting the fluid path by manipulating the at least one valve based on the recipe;

pumping water through the continually-adjusted fluid path past at least one of the at least one valve to a mix cassette, an amount of the water being based on the recipe;

pumping at least one solution through the continually-adjusted fluid path past at least one of the at least one valve to the mix cassette, a solution amount of the at least one solution being based at least on the recipe;

mixing the water and the at least one solution in the mix cassette to form a medium, a mixing amount of the mixing being based at least on the recipe;

pumping the medium through the continually-adjusted fluid path to a reservoir based at least on the recipe;

pumping the medium through the continually-adjusted fluid path from the reservoir to a bioreactor based at least on the recipe, the medium becoming a used medium in the bioreactor; and

pumping the used medium through the continually-adjusted fluid path from the bioreactor to a drain based at least on the recipe.

14. The method as in claim **11** wherein the water comprises deionized water.

15. The method as in claim **11** further comprising:

filtering the water;

deaerating the water; and

if a water amount of the water exceeds a pre-selected threshold, storing at least part of the water.

16. The method as in claim **13** wherein the at least one solution comprises a concentrated form of the at least one solution.

17. The method as in claim **11** comprising:

covering at least one pumping chamber and at least one fluid valve of at least one cassette with a flexible sheet;

housing the donor tissue in a bioreactor, the bioreactor being in fluid communication with the at least one cassette;

receiving, by at least one module processor, the at least one controller command from the controller;

generating, by the at least one module processor, at least one module command based on the at least one controller command, the at least one module command being addressed to at least one module;

receiving, by the at least one module, the at least one module command;

generating, by the at least one module, a plurality of valve commands based on the at least one module command, the plurality of valve commands governing fluid flow through a plurality of valves of the at least one module, the at least one fluid valve controlling pressure applied to the flexible sheet via outlet ports; and

decellularizing the donor tissue using the fluid flow metered based on the at least one controller command.

18. The method as in claim **17** wherein the at least one cassette comprises a pneumatically controlled cassette.

19. The method as in claim **17** wherein at least one of the at least one cassette comprises a disposable cassette.

20. The method as in claim **11** further comprising: iteratively decellularizing and recellularizing the donor tissue until the transplantable tissue is generated.

21. The method as in claim **20** further comprising: applying a first protocol to the decellularizing; and applying a second protocol to recellularizing.

22. The method as in claim **20** further comprising: introducing the donor tissue to at least one agent for a pre-selected amount of time; and introducing a cell culture to the donor tissue.

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